UltraMAX™ LX5120

ULTRA 27-LINE SCSI TERMINATOR

PRODUCTION DATA SHEET

DESCRIPTION

The LX5120 UltraMAX™ terminator represents next-generation technology for SCSI termination applications. The low-voltage BiCMOS architecture employed in its design offers superior performance to older passive and active techniques.

Linfinity's architecture employs high-speed adaptive elements for each channel, providing the fastest response possible. The channel bandwidth is typically 35MHz. The LX5120 compares favorably to older linear regulator approaches whose bandwidth's are dominated by the output compensation capacitor and are limited to the 500KHz bandwidth region (see further discussion in the Functional Description section). Linfinity's architecture also eliminates the output compensation capacitor typical in earlier terminator designs. Each is approved for use with SCSI-1,-2,-3, ULTRA and beyond — providing the highest performance alternative available today.

Another key improvement of LX5120 products lies in their ability to ensure reliable, error-free communications even in systems which do not necessarily adhere to recommended SCSI hardware design guidelines, such as the use of improper cable lengths and impedances. Frequently, this situation is not controlled by the peripheral or host designer and, when problems occur, they are the first to be made aware of these problems. The LX5120 architecture is much more tolerant of marginal system integrations.

Recognizing the needs of portable and configurable peripherals, the LX5120 has a TTL compatible sleep/disable mode. To enter this mode, the DIS pin must be driven low, thereby disconnecting the LX5120 from the SCSI bus. Quiescent current is less than 150µA in this mode.

Reduced component count is also inherent in the LX5120 architecture. Traditional termination techniques require large stabilization and transient protection capacitors of up to 20µF in value and size. The LX5120 architecture does not require these components, allowing all the cost savings associated with inventory, board space, assembly, reliability, and component costs.

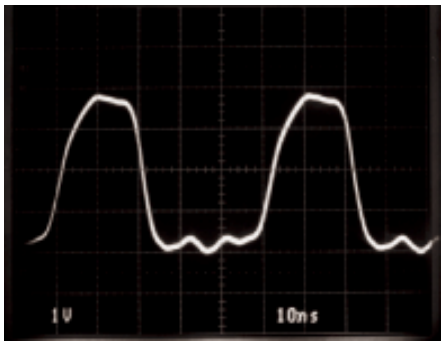
KEY FEATURES

- Ultra-Fast Response For Fast-20 SCSI Applications
- Split Disconnect For Mixing 16-Bit (Wide) Or 8-Bit (Narrow) Buses
- 35mhz Channel Bandwidth
- Sleep-Mode Current Less Than 150µA
- Hot-Swap Compatible
- NO External Compensation Capacitors
- Compatible With Active Negation Drivers
- Superior Pin-for-Pin Replacement For The UCC5620

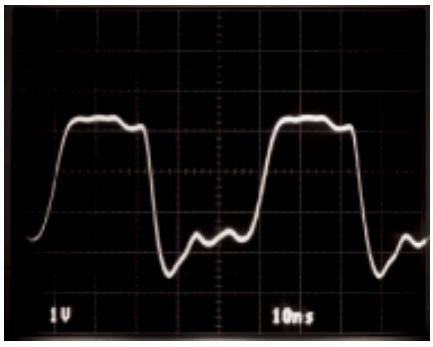
NOTE: For current data & package dimensions, visit our web site: **http://www.linfinity.com.**

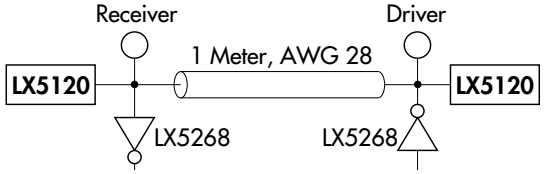
PRODUCT HIGHLIGHT

RECEIVING WAVEFORM - 20MHz



DRIVING WAVEFORM - 20MHz





NOTE:
For An In-Depth Discussion On Applying SCSI, Request Linfinity Application Note: "Understanding The Single-Ended SCSI Bus"

PACKAGE ORDER INFO

T_J (°C)	DB Plastic SSOP 36-pin
0 to 125	LX5120CDB

Note: Available in Tape & Reel.
Append the letter "T" to part number. (i.e. LX5120CDBT)

Rev. 1.0 4/00

LINFINITY MICROELECTRONICS INC.
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ABSOLUTE MAXIMUM RATINGS (Note 1)

TermPwr Voltage 7V
Continuous Output Voltage Range ..... 0 to 5.5V
Continuous Disable Voltage Range ..... 0 to 5.5V
Operating Junction Temperature
Plastic (DB Package) ..... 150°C
Storage Temperature Range ..... -65°C to +150°C
Solder Temperature (Soldering, 10 seconds) ..... 300°C

Note 1. Exceeding these ratings could cause damage to the device.

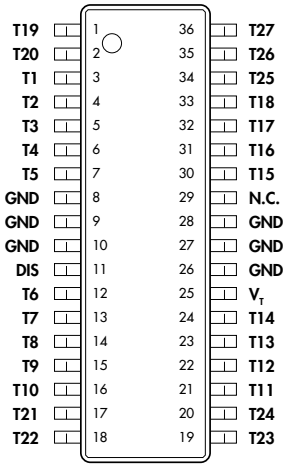
THERMAL DATA

DB PACKAGE:

THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA}	50°C/W

Junction Temperature Calculation: $T_J = T_A + (P_D \times \theta_{JA})$.
The θ_{JA} numbers are guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.

PACKAGE PIN OUTS



DB PACKAGE
(Top View)

RECOMMENDED OPERATING CONDITIONS (Note 2)

Parameter	Symbol	Recommended Operating Conditions			Units
		Min.	Typ.	Max.	
Termination Voltage	V_{TERM}	4.0		5.5	V
High Level Disable Input Voltage	V_{IH}	2		V_{TERM}	V
Low Level Disable Input Voltage	V_{IL}	0		0.8	V
Operating Virtual Junction Temperature Range					
LX5120C		0		125	°C

Note 2. Range over which the device is functional.

ELECTRICAL CHARACTERISTICS

Term Power = 4.75V unless otherwise specified. Unless otherwise specified, these specifications apply at the recommended operating ambient temperature of T_A = 25°C. Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.

Parameter	Symbol	Test Conditions	LX5120			Units
			Min.	Typ.	Max.	
Output High Voltage	V_{OUT}		2.65	2.85		V
TermPwr Supply Current	I_{CC}	All data lines = open		12	20	mA
		All data lines = 0.2V		635	670	mA
		DIS (Disable) Pin >2.0V		10	150	µA
Output Current	I_{OUT}	V_{OUT} = 0.2V	-20	-23	-24	mA
Disable Input Current	I_{IN}	DIS = 0V			-10	µA
Output Leakage Current		DIS > 2.0V, V_O = 0.2V			1	µA
Channel Bandwidth	BW			35		MHz
Termination Sink Current, per Channel	I_{SINK}	V_{OUT} = 4V	7			mA

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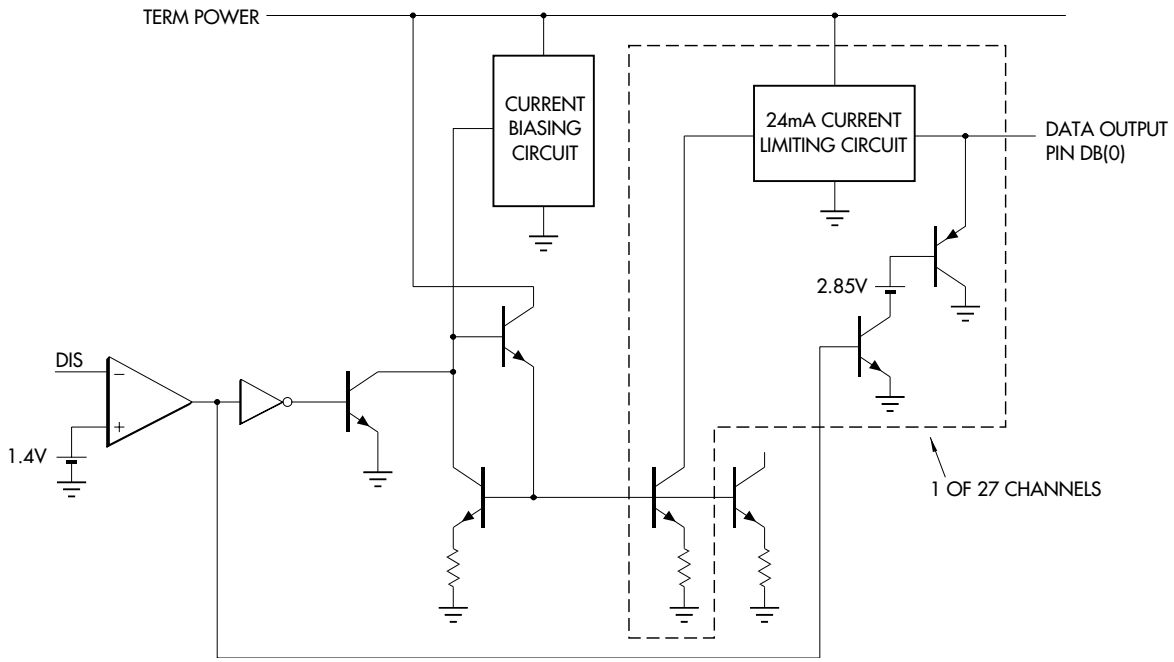
BLOCK DIAGRAM



FUNCTIONAL DESCRIPTION

Cable transmission theory suggests that in order to optimize signal speed and quality, the termination should act both as an ideal voltage reference when the line is released (de-asserted) and as an ideal current source when the line is active (asserted). Common active terminators, which consist of Linear Regulators in series with resistors (typically 110Ω), are a compromise. As the line voltage increases, the amount of current decreases linearly by the equation V = I * R. The UltraMAX LX5120, with its unique new architecture, applies the maximum amount of current regardless of line voltage until the termination high threshold (2.85V) is reached.

Acting as a near ideal line terminator, the LX5120 closely reproduces the optimum case when the device is enabled. To enable the device the DIS (Disable) pin should be driven low. During this mode of operation, quiescent current is 20mA (Max.) and the device will respond to line demands by delivering 24mA on assertion and by imposing 2.85V on de-assertion. Disable mode places the device in a sleep state, where a meager 150µA (Max.) of quiescent current is consumed. Additionally, all outputs are in a Hi-Z (impedance) state. Sleep mode can be used for power conservation or to completely eliminate the terminator from the SCSI chain.

An additional feature of the LX5120 is its compatibility with active negation drivers.

POWER UP / POWER DOWN FUNCTION TABLE

Disable LX5120	Outputs	Quiescent Current
L	Enabled	20mA (Max.)
H	HI Z	150µA (Max.)
Open	HI Z	150µA (Max.)